- An increased production of free radicals: 0.105 ± 0.023 vs. 0.073 ± 0.022 μM/min/mg ($p < 0.001$).

In the preconditioning group, mitochondrial respiration is restored in IL (Vmax = 8.85 ± 2.07 vs. 9.08 ± 1.89 μmol02/min/g), and production of free radicals is reduced (0.084 ± 0.018 vs. 0.082 ± 0.027 μM/min/mg). There is no difference between IL and CL. In the post-conditioning group, there is a significant alteration, both in IL and CL, with impaired mitochondrial respiration (Vmax = 5.03 ± 1.14 vs. 6.78 ± 1.29 μmol02/min/g) and increased production of free radicals (0.161 ± 0.077 vs. 0.092 ± 0.052 μM/min/mg).
Conclusion: Statins have protective effects on skeletal critical ischemic muscle in primary prevention. They have deleterious effects in secondary prevention, by alteration of the mitochondrial respiratory function and by increased production of free radicals.

Nanotopography and Plasma Treatment: Redesigning the Surface for Vascular Graft Endothelialisation

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Introduction: Current vascular graft materials in clinical use, such as PTFE and Dacron®, do not endothelialise and have low unacceptable patency rates. The importance of an endothelial cell layer on the luminal surface of a vascular graft is well-known. The influence of topographical features and surface chemistry on cellular adhesion and proliferation is recognised and under investigation. A nanocomposite polymer has been developed which has shown promise as a vascular graft material due to its compliant, biocompatible and anti-thrombogenic properties. However, despite these benefits a lack of endothelialisation is still a cause for major concern.

Our aim in this work is to investigate the potential of plasma treatment and topographical structures on the luminal graft surface to enhance the self-endothelialisation potential of a nanocomposite vascular graft material.
Methods: POSS-PCU is a polycarbonate urea urethane (PCU) with a nanoparticle, polyhedral oligomeric silsesquioxane (POSS) incorporated within it and fabricated according to published protocols. Microgrooves (MG) of pitch 25 μm were fabricated using photolithography and nanopits, Near-Square (NSQ), were fabricated using electron beam lithography. These were then embossed onto the POSS-PCU polymer and replication fidelity was confirmed using atomic force microscopy (AFM) and scanning electron microscopy (SEM). The samples then underwent oxygen plasma treatment at different powers at a fixed time (40 W, 60 W, 80 W at 60 seconds). Successful plasma treatment was confirmed by water contact angle (WCA) measurements.

Human Umbilical Vein Endothelial Cells (HUVECs) were seeded onto the treated polymer samples and cell proliferation was measured using Live/Dead Cell® staining. Immunostaining of vinculin and actin was conducted to observe cell morphology and adhesion.
Results: The embossing of the micro- and nanostructures were replicated with high fidelity, as seen by SEM and AFM. The microgrooves have a pitch size of 25 μm. NSQ was also verified to be 120nm pits with centre-centre spacing of 300 nm with ±50 nm offset in pit placement. Oxygen plasma treatment of the different samples, show that increase in power increased significantly the hydrophilicity of the samples ($p < 0.05$). These had a direct impact on giving the optimal surface on which HUVECs preferentially proliferate and adhere, with an average WCA of 68°, giving the highest HUVEC growth. HUVEC proliferation was seen to increase on NSQ surfaces over MG and planar samples, retaining both morphology and function.
Conclusion: These exciting observations indicate an important role for nanotopography and plasma treatment in the development of vascular grafts.

Cost-effectiveness Analysis of Open and Endovascular Repair for Ruptured Abdominal Aortic Aneurysm

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Introduction: Emergency endovascular repair (EVAR) for ruptured abdominal aortic aneurysm (rAAA) may have lower operative mortality rates than open surgical repair. Concerns remain that the early survival benefit after EVAR for rAAA may be offset by later interventions. The aim of this study was to analyse the cost-effectiveness of EVAR compared with standard open repair (OR) in the treatment of rAAA.
Methods: A model-based cost—utility analysis was performed estimating mean costs and quality-adjusted life-years (QALYs) per patient in the UK National Health Service with a 1-year time horizon. A decision tree model was constructed and populated with probabilities, outcomes and cost data from IMPROVE, AJAX & NOTTINGHAM trials and NHS reference cost for rAAA for 30 days mortality. Probabilities, outcomes and cost data for long-term complications were obtained from published data on elective repair of AAA because of lack data for rAAA. This method of using the best available data to make reasonable assumption in economic models is a common method used by several groups. This is to make the economic model more credible and to capture the effects of long-term complications on the cost-effectiveness of EVAR vs. OSR. The results from the model were assessed using one-way and probabilistic sensitivity analyses.
Results: The cost of EVAR and open repair combined with the cost of the long term complications over one year were £5533.40 and £5963.75 respectively. Both treatments costs were well below the lower margin of the societal willingness to pay in the UK (£20000) for one gained QALY. The net monetary benefit (NBM) for OSR was £25448.3—47442.6 compared to EVAR with NBM £18198.5—36046.1. The NBM is a recommend method to assess cost-effectiveness by the national institute of health and care excellence (NICE).
Conclusion: Performing OSR on rAAA is a cost effective strategy with better NBM when compared to EVAR. However both EVAR and OSR cost less than the societal willingness threshold for the QALYs gained.

Mid-term Survival and Reinterventions After Endovascular Versus Open Repair in Ruptured Abdominal Aortic Aneurysms

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Introduction: In elective aortic surgery, the mid-term risk of reinterventions is higher after endovascular aneurysm repair (EVAR) than after open repair (OR). In the present study we aimed to compare the mid-term reintervention free survival after EVAR and OR in patients with a ruptured abdominal aortic aneurysm (RAAA).
Methods: An observational cohort study was carried out including all consecutive surgically treated RAAA patients between 2004 and